

Workshop



TAPPI and North Carolina State University present

Hands-on Workshop for Pulp & Paper Basics

*March 15-19, 2010, June 7-11, 2010 and October 4-8, 2010
North Carolina State University, Raleigh, North Carolina*

To register, go to: <http://cnr.ncsu.edu/wps/acadprogs/handson.html>

Special Benefits for Course Participants

This unique workshop will provide attendees an overall view of the basic concepts in pulp and paper manufacturing. Attendees will increase their understanding by participating in hands-on laboratory exercises.

The balanced lectures and laboratories provide to students an easy to learn and lasting introduction to pulp and paper technology, operations, and markets.

- Get an overview of the entire pulping and papermaking process
- Find out how different processes affect paper properties
- Perform hands-on lab experiments to enhance understanding of process
- Run a pilot plant paper machine
- Close interaction with NCSU Pulp and Paper Professors in small groups

Hands-on Workshop for Pulp and Paper Basics

March 15-19, 2010, June 7-11, 2010 and October 4-8, 2010

North Carolina State University and TAPPI will present the Hands-on Workshop for Pulp and Paper Basics. This unique workshop will provide attendees an overall view of the basic concepts in pulp and paper manufacturing. Attendees will increase their understanding by participating in hands-on laboratory exercises.

WORKSHOP OVERVIEW

This hands-on laboratory based workshop will provide a broad overview of Pulping, Bleaching, Chemical Recovery, Recycling, Papermaking and Converting. The 5-day course will consist of presentations each morning and hands-on laboratory and pilot-plant exercises every afternoon. Course material discussed in the morning will be re-emphasized in lab and pilot plant exercises for increased understanding.



WHO SHOULD ATTEND

This introductory-level course is appropriate for technical and non-technical individuals with a desire for a laboratory focussed course to understand and appreciate the basics of pulping, bleaching, recovery, recycling, papermaking and converting operations.

The course is especially beneficial for:

- New process engineers, manufacturing operators and technicians who want to understand more fully how raw materials are processed into products.
- Individuals who wish to broaden their knowledge of the processes through basic laboratory and pilot paper machine experiences.
- Sales and service personnel, machine operators, and maintenance personnel who need to better appreciate paper machine operations by conducting a pilot paper machine trial.
- Individuals who have completed TAPPI's Introduction to Pulp and Paper short course and who want to benefit from the laboratory and pilot plant experiences.
- People who have not had any training in pulp and paper will greatly benefit from this course.

LEARNING OUTCOMES

Participants who complete workshop should be able to:

- Discuss the structure and chemistry of wood
- Analyze the chip preparation operation
- Describe chemical and mechanical pulping processes
- Describe pulp processing operations
- Describe the stages and operations of bleaching
- Discuss the importance of chemical recovery in a pulp mill
- Discuss waste treatment and environmental regulation
- Identify the major grades and properties of paper
- Discuss stock preparation and the approach system
- Explain the operation of the wet end and dry end of the paper machine
- Discuss basic converting operations
- Discuss the recycling of paper



2010 Hands-on Workshop for Pulp and Paper Basics

Preliminary Schedule

The five day workshop will include presentations in the morning followed by afternoon sessions of laboratory or pilot plant exercises. Participants will work in small groups on the various lab experiments. The following is a tentative outline of the planned activities.

Note: If a group of students from a company is interested in introductory topic not covered, prior arrangements can be made to conduct an extra teaching session in the evening on the specific topic at no extra charge.

DAY ONE

8:00 a.m. – 5:00 p.m.

- Introduction
- Wood Structure and Chemistry
- Woodyard Operations
- Kraft Pulping
- Pulping Lab
 - Perform a lab-scale kraft pulping experiment*
- Chipping Lab
 - Perform and analyze the chipping operation*
- Wood and Fiber Analysis
 - Identify wood and fiber structures using a microscope and Fiber Quality Analyzer*



DAY TWO

8:00 a.m. – 5:00 p.m.

- Pulp Processing
- Bleaching
- Chemical Recovery
- Environmental
- Cleaning Lab
 - Calculate the efficiency of a cleaner*
- Bleaching Lab
 - Perform and analyze a bleaching operation*
- Kappa and Viscosity Lab
 - Perform the Kappa and viscosity tests*

DAY THREE

8:00 a.m. – 5:00 p.m.

- Paper Grades
- Stock Preparation
- Paper Machine Approach Systems
- Handsheet/Refining Lab
 - Make a handsheet and perform refining on pulp*
- Paper Testing Lab
 - Perform major paper tests*
- Coatings Lab
 - Produce coated papers and measure optical properties*



DAY FOUR

8:00 a.m. – 5:00 p.m.

- Wet End of the Paper Machine
- Dry End of the Paper Machine
- Converting Operations
- Pilot Paper Machine Trial
 - Stock preparation; wet end process analysis; dryer energy balance; finished paper analysis*

DAY FIVE

8:00 a.m. – 2:00 p.m.

- Recycling Markets
- Recycling and Paper Quality
- Paper Recycling Operations
- Image Analysis Lab
 - Understand and operate an image analysis system to measure dirt*
- Flotation Deinking Lab
 - Use lab flotation cell to deink*
- Screening of Stickies Lab
 - Perform a lab-scale screening experiment to remove stickies*

2010 Hands-on Workshop for Pulp and Paper Basics

Workshop Faculty

The workshop will be taught by Pulp & Paper Faculty of North Carolina State University:



Dr. Hasan Jameel has been teaching at NCSU since 1987 and in 2000 was named a Distinguished Professor. He worked for International Paper at the Corporate Research Center and the Ticonderoga mill from 1979-1987. His main research and technology interests are in the areas of pulping and bleaching, process modeling, development of bio-fuels from wood, and environmental impact of processes. He teaches an undergraduate course involved in the unit operations of pulp and paper and a laboratory course in pulping and bleaching.



Dr. Med Byrd received his doctoral degree from NCSU in wood and paper science in 2000. He worked as a Technical Process Support Engineer for Procter and Gamble Cellulose in Memphis, Tennessee from 1986-1989 and worked from 1989-1992 as a Process Engineer for Black and Veatch Engineers. He currently is the Coordinator of Undergraduate Studies in the department and teaches the introduction to pulp and paper technology course. His technology and research interests involve the pulping and bleaching of non-wood fibers, mechanical pulping, and optimized papermaking operations.



Dr. Joel Pawlak has been teaching at NCSU since 2001. He has industrial experience with Eastman Kodak Company and Haverhill Paperboard. He teaches courses involving paper properties, physics and performance. His research interests are involved in the modeling of fibrous networks, the role of novel processes for the creation of new bio-based materials, the use of enzymes to improve fiber supply, and novel/modified processes for the enhancement of paper properties.



Dr. Richard Venditti has taught at NCSU since 1993 and currently is the Director of Graduate Studies in the department. He teaches courses in unit operations of pulp and paper, process control in the paper industry and paper recycling. His technology and research interests are involved in the separation of contaminants from fibers, including flotation de-inking and screening of stickies, sensors and systems to automatically sort wastepaper, and the development of advanced bio-based materials and fuels from wood and other sources. Venditti has industrial experience with Great Southern Paper Company, Jaakko Poyry, Union Camp and Boise Cascade.

TAX DEDUCTIBLE EXPENSE?

Expenses for continuing education taken to maintain or improve professional skills may be tax deductible. Certain restrictions apply. Check with your accountant for details.

To register, go to: <http://cnr.ncsu.edu/wps/acadprogs/handson.html>

2010 Hands-on Workshop for Pulp and Paper Basics

General Information and Registration

WORKSHOP MATERIALS

Participants will receive a set of course notes prepared by the instructors to supplement the presentations made during the course.

CEUs

TAPPI will award 3.7 continuing education units (CEUs) to participants who attend at least 80% of the education sessions and complete a final program evaluation. The Education Department of TAPPI meets the Criteria for Certification established by the Authorized Provider Commission of the International Association for Continuing Education and Training (IACET), 1620 I Street NW, Washington DC 20006.

WORKSHOP LOCATIONS

The course presentations and the laboratories will be held on the campus of NCSU, Department of Wood and Paper Science, Biltmore Hall, Corner of Western Blvd and Dan Allen Drive. The course will start at 8:00 AM on Monday and will end on Friday at 2:00 pm. The recommended dress code is casual but should be lab appropriate.

REGISTRATION

The registration fee is \$1750.

Please go to <http://cnr.ncsu.edu/wps/acadprogs/handson.html> to register.

This registration fee includes tuition, materials, refreshment breaks, a certificate and one dinner each session. Lodging is not included in the registration fee. The number of students in the course will be limited in size (to 32) for maximum effectiveness and registrations will be accepted in the order they are received. The registration fee should be received no later than two weeks prior to the course starting date. Contact Mari Asanuma (919-272-0621 or masanuma@nc.rr.com) for availability of space less than one week before the course. The registration fee cannot be refunded if cancellation is made less than two weeks before the course starting date. Substitute participants can be sent to the course. Registrations can be done by online credit card payment or by check. The online registration will only accept registrations up to the maximum number of students allowed. To register by online credit card payment, please go to: <http://store.wps-education.org> To register and pay by check, contact Mari Asanuma at 919-272-0621 or masanuma@nc.rr.com.

HOTEL

Participants are responsible for their own hotel arrangements. Suites have been set aside at the Embassy Suites Raleigh/Crabtree Valley, 4700 Creedmoor Road, Raleigh, NC 27612, Phone: 919.881-0000. Lodging is not included in the registration fee. The hotel guarantees room availability up to two weeks before the course. Ask for the special NCSU Hands-on Workshop for Pulp and Paper suite rate of \$109. A breakfast and social hour are included with the suite. The suites have a bedroom, living room and kitchenette area. The hotel provides transportation from the airport, has an exercise room/indoor pool and is walking distance away from a major regional shopping mall.

ADDITIONAL INFORMATION

For answers to questions related to course content, please contact Dr. Richard Venditti at +1.919.515.6185. For questions related to registration and payment, please contact Mari Asanuma (phone: +1.919.272.0621) or masanuma@nc.rr.com. The contents of this brochure can also be found at the Department of Wood and Paper Science website: www.cnr.ncsu.edu/acadprogs/handson.html

PAST PARTICIPANTS HAVE SAID...

- The information was detailed and easily understood by both engineers and non-engineers. I will definitely suggest the course to others!
- I'll be able to understand the wood and pulping process in order to determine the costs associated with them.
- I enjoyed the course very much. I wish my machine operators and other technicians could take it.
- This is a very good course. The course tied a lot of things together for me.
- This is an excellent course; providing an intense overview of the entire papermaking process.
- The experiments that were conducted were very supportive of the lecture component of the class and made a big difference in my level of understanding.
- The lab experiments were great. It really helps to understand the system when you can work with it "hands-on". The course material and information were excellent.
- Instructors were very enthusiastic and knowledgeable about their presentation and lab topics.
- Highly recommended for anyone interested in increasing their knowledge in the process of pulp and paper making.
- Liked the detail mass balance around the wet and dry ends of the pilot plant machine.



To register, go to: <http://cnr.ncsu.edu/wps/acadprogs/handson.html>